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Crypto Assets in Insolvency – Rights of Crypto Asset Holders under Austrian Law

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I. Preamble: Let's not Get Lost in Technology

At the time of writing this chapter, crypto assets have a 15-year history behind them. By their very nature, lawmakers as well as legal scholars are always one step behind when it comes to new technologies. Any new phenomena must first reach a certain critical mass to even be noticed in legal circles. If you don't hear about it, you don't think about it. Then, an understanding of the new phenomenon must mature. Only those who have a practical understanding of what they talk about can dare to tackle the legal side of the matter. And finally, a common language must be found in the collective discourse of the new phenomenon. Only then can one build on the insights of the other.

The phenomenon of crypto assets has obviously reached the necessary critical mass. The blockchain, or distributed ledger technology (DLT) is undoubtedly revolutionary. Understanding it is also crucial for its legal assessment. Nevertheless, one should avoid attaching more importance to technological aspects than they deserve in legal discussion.

The fact that such a risk exists is illustrated by the simple example of the transfer of a Bitcoin in return for payment: For the acquirer, it is important that the Bitcoin comes under his or her control; for the transferor, that they receive payment. From the perspective of the involved parties, this suggests a simple purchase. If one shifts the legal analysis to the technical level, the transferor must enter a new transaction into the blockchain, which in turn leads to the recipient's further power of disposal over the Bitcoin. Viewed from this perspective, what matters is the bringing about of a certain result, which suggests a contract for work.

The respective conclusions are not right or wrong per se, but the result of different levels of abstraction in the legal analysis. In this context, the quite perceptible tendencies to solve legal issues around crypto assets on the technological

level are remarkable. Previous developments of the Internet age were rightly not legally discussed on a technological level. Understanding TCP/IP is not necessary to recognise that parties can exchange declarations of intent over the Internet, or that an animation on a screen can be copyright infringement. Even those who find a convincing counter-argument based on data transfer via TCP/IP must ultimately fail with it. It is simply an inadmissible level of abstraction.

Time and again, however, the legal discussion of crypto assets commits precisely this error. A detailed understanding of DLT and blockchain technology is necessary to see why the parties involved behave as they do. At this point, however, the influence of technology in legal discourse must end. Further analysis must tie in with human behaviour, and must tie in with how individuals interact with the technology and one another. This is the substance of the law. Let's not get lost in technology.

II. Introduction: Tackling the Question

Although the title of this chapter sounds innocent and simple, it is all but. In order to even identify where questions of insolvency can arise, first, we need to make a distinction between public (decentralised) blockchains such as Bitcoin or Ethereum, where anyone can join the consensus mechanism, and private (centralised) blockchains, where nodes are operated by one or a small number of parties and therefore can rather easily be controlled or shut down by whoever is in control. We shall call any such entity in control of a private blockchain the '**operator**'. Second, we must distinguish between crypto assets that do not represent rights vis-à-vis another party, such as, again, Bitcoin or Ethereum, and crypto-assets that serve as the carrier medium for such rights. Where a contractual counterparty exists, we shall call it the '**issuer**', even if it may be a bit unprecise in edge cases. When it comes to tokenisation, ie, the process of linking DLT-based tokens to real-world assets, we must also consider cases where '**asset custodians**' are part of the picture, holding these real-world assets on behalf of token holders. Lastly, we have to take into account parties that serve as '**crypto custodian**' holding crypto assets on behalf of others. Examples are custody providers for crypto assets or operators of trading platforms. Anyone being in a contractual relationship with one or more of the aforementioned entities shall be called a '**holder**' of crypto assets.

Depending on: (a) the type of blockchain used (public or private), (b) the type of crypto asset (issuer or issuer-less), (c) the question of whether real-world assets are being tokenised (asset custodian present or not) and (d) the type of custody of the crypto asset itself (crypto custodian present or not), a number of different parties may have to be considered for insolvency purposes.

Further, in order to make any statements as to how crypto assets are to be treated in the case of insolvency of any of the aforementioned parties, one must analyse where in the present legal framework this phenomenon fits.

III. Public Blockchains in Austrian Law

A. No Contractual Relationship Among Miners or Validators

The core aspect of public blockchains is their decentralisation. This means that: (i) no central authority adds new data to the blockchain; and (ii) no central authority determines who is to take over this task next. This is achieved by agreeing on a consensus mechanism, which allows consensus to be reached, in a decentralised fashion, on the selection of the next person responsible for this task. From the perspective of Austrian private law, the interesting questions are how agreement on the consensus mechanism is formed and how it is to be qualified legally.

i. Agreeing to a Consensus Mechanism not a Legal Declaration of Intent

The question of how the consensus mechanism is agreed upon shall only briefly be discussed for the two most relevant consensus mechanisms (ie, Bitcoin's proof-of-work, and Ethereum's proof-of-stake): With respect to proof-of-work, mining requires the use of highly specialised hardware that follows the consensus mechanism that has been programmatically established beforehand.[1] Those who use such hardware in a way that becomes apparent to other miners conclusively declare to agree on the consensus mechanism. With respect to proof-of-stake, when operating validators, units of the respective virtual currency are used as a stake to affirm one's own adherence to the consensus rules. Anyone who takes the technically necessary steps to set up a validator, and who is thereby entered into a list of active validators, also conclusively declares to agree to the consensus mechanism.

As to the legal quality of such declarations and the agreements resulting from them, it is important to stress a central principle of Austrian private law: Not every agreement (*Vereinbarung*) is also a legal contract (*Vertrag*). A declaration of intent (*Willenserklärung*) in Austrian private law (such as an offer or acceptance) is more than just 'declaring one's intent'. Matching declarations of intent always lead to an agreement. However, the Austrian Civil Code does not concern agreements but legal transactions (*Rechtsgeschäfte*).

For the conclusion of legal transactions, it is necessary that the parties form legal transaction intent (*Rechtsgeschäftswillen*). To this end, the declarations of intent must be aimed at establishing, amending, or terminating rights or legal relationships.[2] The declaration of intent must aim to trigger legal consequences.[3]

[1] *cf* C Sillaber, 'Mining your own business? Betrieb dezentraler Systeme als GesbR' [2019] *ecolex* 849.

[2] P Rummel, 's 863 ABGB' in P Rummel and M Lukas (eds), *ABGB*, 4th edn (Vienna, MANZ, 2023) para 6 et seq.

[3] Known as *Rechtsfolgentheorie*, W Flume, *Das Rechtsgeschäft*, 3rd edn (Berlin, Springer, 1979) 51 et seq; F Bydlinski, *Privatautonomie* (Vienna, Springer, 1967) 7.

If the declaration aims merely at triggering social or economic consequences, there is no legal transaction intent.[4] Whether the declarant has intended legal consequences must be assessed from the perspective of the recipient of the declaration.

This distinction makes it possible to differentiate between legal transactions and transactions that are not intended to trigger legal consequences. The question of whether legal transaction intent exists is not determined by the true intention of the declarant, but rather by the recipient's understanding in accordance with the 'theory of trust' (*Empfängerhorizont nach der Vertrauenstheorie*).[5] The declaration is deemed to have been made in the manner in which it could be understood by a reasonable recipient. Therefore, the contours of a declaration of intent shall not be determined by the actual existence of legal intent, but by the objective understanding of the declaration.[6]

How does the declaration, or agreement, to adhere to a consensus mechanism fit into this private law framework? Considering the block reward,[7] anyone who adds a new block with transactions to the Bitcoin or Ethereum blockchain creates new Bitcoins or Ether for themselves. This is also the central economic incentive to act as a miner or validator in the Bitcoin or Ethereum network in the first place. The concrete design of the consensus mechanism can therefore have far-reaching economic consequences.

However, as pointed out above, a declaration must be aimed at more than triggering economic consequences to be considered showing legal transaction intent under Austrian law. And the objective meaning of the declarations made when conducting mining or operating a validator is not directed at the creation, modification or cancellation of rights or legal relationships. The declaration, whether explicit or conclusive, to comply with the consensus mechanism of a given blockchain does therefore not constitute a declaration of legal transaction intent.

The agreement of, or consent to, a consensus mechanism, which concerns the question of who will generate the next block and therefore also who may obtain the block reward (and transaction fees), does not lead to the conclusion of a contract pursuant to section 861 of the Austrian Civil Code. The creation of a block does not concern the establishment, modification or cancellation of rights or legal relationships. The necessary legal transaction intent for the conclusion of a contract is lacking.

[4] Known as *Grundfolgentheorie*, eg, T Mayer-Maly, *Einführung in die allgemeinen Lehren des österreichischen Privatrechts* (Graz, Leykam, 1984) 39; O Lenel, 'Parteiabsicht und Rechtserfolg' in R von Jhering (ed), *Jahrbücher für die Dogmatik des heutigen römischen und deutschen Privatrechts XIX* (Jena, Fischer, 1881) 154; against F Bydlinski, 'Verträge über ärztliche Leistungen' in WH Rechberger and R Welser (eds), *Festschrift für Winfried Kralik zum 65. Geburtstag* (Vienna, MANZ, 1986) 345, 352.

[5] A Riedler, 's 863 ABGB' in M Schwimann and G Kodek (eds), *ABGB Praxiskommentar*, 4th edn (Vienna, LexisNexis, 2014) para 1.

[6] R Bollenberger, 's 863 ABGB' in H Koziol, P Bydlinski and R Bollenberger (eds), *Kurzkommentar zum ABGB* 5th edn (Vienna, Verlag Österreich, 2017) para 3.

[7] As for transaction fees, see below.

The decentralised nature of public blockchains means that the mere fact that people are mining, or operating validators does not imply the existence of a legal relationship between miners or validators.[8] Such a relationship does not exist without special circumstances (eg, in cases where miners/validators contract to form a mining pool).

How does this insight fit with the fact that miners or validators obtain Bitcoins or Ether for themselves with the block reward? Bitcoins are at least subject to property rights in a broader sense under Austrian law (*Eigentumsrecht im weiteren Sinn*).[9] In the absence of a central authority, it is also clear that the process of obtaining the block reward must be based on an original form of ownership acquisition (*originärer Eigentumserwerb*). Mining or staking is therefore not completely without legal consequences. After all, a new property right in Bitcoins or Ether is created when obtaining the block reward. However, this is not because of the agreement of the consensus mechanism, but rather a result of its execution by the respective miner or validator.

ii. Executing the Rules of the Consensus Mechanism as a Real Act

Thus, the last question to be discussed is how compliance with, or execution of, the consensus mechanism is to be classified in terms of legal transactions under Austrian law. How is it to be assessed when a miner in the Bitcoin network (or generally, in the case of proof-of-work) or a validator in the Ethereum network (or generally, in the case of proof-of-stake) transfers a block to other miners or validators? Looking at Bitcoin, the miner has provided the proof-of-work; looking at Ethereum, the validator was selected in the proof-of-stake process. In this situation, the next step is to submit the new block to the other miners or validators, who will hopefully accept it as valid so that it becomes part of the blockchain. The word 'hopefully' must be emphasised, because, in the absence of a contractual relationship, miners or validators on public blockchains have no legal claim against one another, allowing them to force the acceptance of a new block. Instead, there are only economic incentives to do so.

How should the transfer of a new block then be assessed? The miner or validator wants to change a factual state, namely that the new block becomes part of the blockchain and that they receive the block reward (and transaction fees). The miner/validator submits the block to the other miners or validators

[8] O Völkel, 'Zur Bedeutung der Dezentralität von Blockchains im Privatrecht' [2019] *Zeitschrift für Finanzmarktrecht* 601, 602.

[9] *cf* H Koziol, 'Sache, Eigentum und persönliche Sachenrechte: vernachlässigte dogmatische Schätze des österreichischen ABGB' in HC Grigoleit and J Petersen (eds), *Privatrechtsdogmatik im 21. Jahrhundert. Festschrift für Claus-Wilhelm Canaris zum 80. Geburtstag* (Berlin, De Gruyter, 2017) 1087; regarding Bitcoin *cf* A Vonkilch and M Knoll, 'Bitcoins und das Sachenrecht des ABGB' [2019] *Juristische Blätter* 139; L Fleißner, 'Eigentum an unkörperlichen Sachen am Beispiel von Bitcoins' [2018] *Österreichische Juristenzeitung* 437; O Völkel, 'Privatrechtliche Einordnung virtueller Währungen' [2017] *Österreichisches Bankarchiv* 385.

precisely because they want to achieve this outcome. Put in legal terms, the miner/validator takes a de facto action, which is linked to a legal intention. The described constellation neatly fits the concept of a real act (*Realakt*) under Austrian private law.

The legal qualification as a real act leads to appropriate results. The legal consequences of a real act occur independently of the legal capacity of the person performing the act.[10] In terms of mining and staking, this means that miners and validators can acquire ownership in newly created Bitcoins and Ether, without it being necessary to examine legal capacity in an individual case. The miner or validator who lacks legal capacity, eg, because of age, therefore also acquires the Bitcoins mined by themselves.

B. Transaction Requests are not Contractual Offers but Public Offers of a Reward

In the case of public blockchains, it follows from their decentralised nature that a transaction request is not handled centrally by one single miner/validator, but in principle in parallel by everyone participating in the network. The fact that the person who publicly transmits a transaction request to the network is indifferent to who ultimately confirms the transaction in a block is essential for the further legal assessment. All that matters to the user is that his or her transaction is taken into account in a block. It is the same with the transaction fee: it does not matter to the user at all which miner or validator ultimately receives it. It is only the result of recording the user's transaction request in a block that counts.

When sending a transaction request, the user promises a reward to the person who ultimately records the transaction in a block. Whoever confirms the transaction request should receive the transaction fee. The consequence of this is that the user's declaration of intent is not an offer within the meaning of section 861 of the Austrian Civil Code, as this would require that it be made to a specific person. The declaration of intent is therefore to be characterised differently under Austrian private law. Specifically, it could fall under the legal category of the public offer of a reward (*Auslobung*). A public offer of a reward becomes binding through the public announcement.[11] Essential to the public offer of a reward are four elements:[12]

- the intention to commit oneself which must be expressed in the respective declaration;
- the exchange purpose, ie, the reward for bringing-about a result;

[10] A Riedler, 's 859 ABGB' in Schwimann and Kodek (n 5) para 6.
[11] Völkel (n 8) 604.
[12] W Kolmasch, 's 860 ABGB' in M Schwimann and M Neumayr (eds), *ABGB Taschenkommentar*, 4th edn (Vienna, LexisNexis, 2017) para 2.

- the public announcement; and
- the indeterminate group of addressees.

The first two elements have been discussed above, and their existence has been established. The law does not impose any particular requirements on the manner of the public announcement. A public notice or publication in the media or on the Internet has been considered sufficient.[13] It is essential, however, that the announcement can actually reach the addressed group. This is ensured in the case of public transaction requests within the respective blockchain network. After all, the transaction request propagates through the entire network of the respective blockchain and is known to all miners or validators after a short time.

Lastly, the public offer of a reward must be directed at an indeterminate group of addressees. A restriction to a certain or definable larger group of persons (ie, miners or validators) does not lead to a different legal assessment.[14] The declaration results in an effective self-commitment of the user towards miners or validators.[15]

The consequence of this legal view is that there is no corresponding obligation to perform on the part of any specific miner or validator. In other words, miners or validators are not obligated to provide a service to users of the blockchain. Each miner or validator is free to execute or ignore transaction requests. If a miner or validator decides to include a transaction in a block, however, this miner or validator is entitled to the transaction fee, ie, the reward promised by the user.

IV. Crypto Assets on Public Blockchains in Austrian Law[16]

A. Crypto Assets are not Receivables

Austrian private law distinguishes between real property rights (*dingliche Sachenrechte*) and personal property rights (*persönliche Sachenrechte*; section 307 of the Austrian Civil Code). Only at first glance does the characterisation of

[13] R Bollenberger, 's 860 ABGB' in Koziol, Bydlinski and Bollenberger (n 6) para 4; Kolmasch (n 12) para 2.

[14] OGH 11. 1. 1989, 9 ObA 516/88.

[15] For details, see H Koziol, 'Freiwillige Selbstverpflichtung von Banken gegenüber der Öffentlichkeit' [2013] *Österreichisches Bankarchiv* 91.

[16] The following assessment applies to coins (ie, native tokens on a given blockchain, eg, Bitcoin on the Bitcoin blockchain, Ether on the Ethereum blockchain) and (non-native) tokens insofar as the programming of the respective smart contract does not grant other persons a possibility to dispose of tokens against the will of another person.

crypto assets as personal property rights seem obvious. Book money, ie, a claim against a credit institution, is counted among the personal property rights. However, the decisive difference between crypto assets on the one hand and book money on the other is that the coin or token does not represent a claim against a third party. The mere fact that a person has the private key to a certain amount of crypto assets does not constitute a claim against any other person. As pointed out above, in particular, there is no claim against miners or validators. Only if there exists another agreement, eg, between the holder and an issuer, the crypto asset may represent a claim against another party. This representation of a claim by a token must be distinguished from the token itself, however.

B. Possession of Crypto Assets

Austrian legal literature unanimously qualifies Bitcoin and comparable crypto assets as things (*Sachen*) within the meaning of section 285 of the Austrian Civil Code.[17] For justification, reference is usually made to the broad definition in the Civil Code. A certain minimum degree of controllability is required for a phenomenon to be qualified as a thing.[18] Completely uncontrollable phenomena such as free air and flowing water,[19] but also ideas or concepts are not recognised as things. These phenomena are not controllable at all and consequently not things in the sense of the law.

The question arises as to why controllability should be the decisive factor and what exactly is meant by controllability in the case of Bitcoin, for example. The answer to the first question can be derived from the concept of assignment (*Zurechnungsgedanke*) in Austrian property law:[20] Without controllability, an assignment of legal goods to legal subjects is not conceivable. In the case of crypto assets, it is the immutability of the blockchain and the necessity of a private key that make the phenomenon controllable.

For the following discussion, a precise understanding of the term 'incorporeal thing' (*unkörperliche Sache*) is decisive. 'Incorporeal thing' refers to things that do not have a physical form (section 292 Civil Code). This is interpreted as spatial delimitability in solid, liquid, or gaseous state.[21] In addition, the law expressly states that all rights belong to the category of 'incorporeal things' and mentions as an example the rights to hunt or to fish (section 292 Civil Code). It follows that rights form only a subgroup of incorporeal things. Besides rights, the Civil Code recognises other things that do not have a physical form as a form of 'other

[17] Vonkilch and Knoll (n 9) 139; Fleißner (n 9) 437; M Aigner, 'Das Pfandrecht und die Blockchain' [2019] *Österreichisches Bankarchiv* 819.

[18] C Holzner, 's 285 ABGB' in Rummel and Lukas (n 2) para 5 with further references; N Hofmann, 's 285 ABGB' in Schwimann and Kodek (n 5) para 3.

[19] ibid.

[20] Hofmann (n 18) para 1.

[21] G Kodek, 's 292 ABGB' in Schwimann and Neumayr (n 12) para 1.

incorporeal thing'. As an example, legal literature mentions sound waves or electromagnetic waves.[22]

On the basis of the framework presented above, it can be examined whether the civil law provisions on possession (*Besitz*; sections 309 ff Civil Code) are also applicable to crypto assets. According to Austrian law, possession is the actual dominion (*custody, power*) over a thing, with the will to have it as one's own (section 309 Civil Code). The object of possession can be all corporeal and incorporeal things that can also be an object of legal transactions (section 311 Civil Code). Since crypto assets are the object of commercial and legal transactions, the provisions on possession apply.

In contrast to corporeal things, incorporeal things are taken into possession by using them in one's own name (section 312 Civil Code). In the case of such unilateral[23] acquisition of possession, third-party possession must be recognisably excluded; the specific requirements are based on the prevailing view of the involved parties (*beteiligte Verkehrskreise*).[24] Accordingly – *not your keys, not your coins* – third-party possession is only recognisably excluded if crypto assets are held at one's own address on the blockchain knowing the associated private key.

The Austrian Civil Code regulates the loss of possession expressly only with regard to tangible things (section 349 Civil Code), immovable property (section 350 Civil Code) and relative rights (section 351 Civil Code). There is no express provision on the category of other incorporeal things, to which crypto assets belong according to the view defended here.

With regard to the quasi-physical quality of crypto assets, it can be argued that the provision for tangible things can be applied *mutatis mutandis* to crypto assets. Accordingly, possession is lost if the thing 'is lost without hope of being found again [1st case]; if it is voluntarily abandoned [2nd case]; or comes into the possession of another [3rd case]'.

An object is lost if it is removed from custody of the possessor without their will and without the acquisition of possession by a third party.[25] Whether there is a loss of custody is to be judged according to the perception of the involved parties.[26] The element 'without hope' is to be understood objectively as the absence of a reasonable prospect of recovery in the foreseeable future; temporary inaccessibility, however, does not mean loss of possession.[27]

In the case of crypto assets, again, the view of the relevant parties must be considered: *Not your keys, not your coins* means that possession is lost if knowledge

[22] E Helmich, 's 292 ABGB' in A Kletečka and T Schauer (eds), ABGB-ON, edn 1.04 (Vienna, MANZ, online via www.rdb.at) para 4; B Eccher and O Riss, 's 292 ABGB' in Koziol, Bydlinski and Bollenberger (n 6) para 1.

[23] OGH 24. 6. 1976, 2 Ob 520/76.

[24] G Kodek, 's 312 ABGB' in Kletečka and Schauer (n 22) para 1.

[25] C Holzner, 's 349 ABGB' in Rummel and Lukas (n 2) para 1.

[26] ibid.

[27] Holzner (n 25) para 2.

of the private key is lost. The temporary inability to dispose of crypto assets, on the other hand, does not lead to a loss of possession, for example because there is no access to the Internet for a certain period of time.

The question of the transfer of possession of other incorporeal things such as Bitcoin or Ether is dealt with below because of the factual connection with a transfer of ownership.

C. Ownership of Crypto Assets

Everything that belongs to a person, all his corporeal and incorporeal things, is called his property (section 353 Civil Code). The object of the right of ownership can therefore both be corporeal and incorporeal things. The prevailing view is that the right of ownership is not fully applicable to claims (incorporeal things).[28] Therefore, a distinction is made between the property right in a narrower sense and in a wider sense (also called 'legal competence', *Rechtszuständigkeit*), whereas only corporeal things should be objects of the property right in the narrower sense.[29]

The question of the ownership of crypto assets has been addressed in Austrian legal literature, especially in connection with Bitcoin. There is at least a consensus that Bitcoins, and probably also comparable crypto assets, can be the subject of a property right in the wider sense.[30]

Fleißner[31] affirms the possibility of an acquisition of property in a narrower sense. She emphasises that the concept of ownership according to the wording of section 353 Civil Code is not limited to tangible objects. *Vonkilch/Knoll*[32] deal with the question of the necessity of a special act of transfer. The authors point out exceptions to the principle of tradition (*Traditionsprinzip*), according to which the transfer by declaration is also to be recognised in the case of crypto assets analogous to section 428 Civil Code. They also argue that the property law provisions of the Civil Code are largely tailored to tangible, actually controllable objects; thus, it can only be decided on the basis of the relevant valuations of the individual property law provisions whether they are applicable to crypto assets. *Aigner*[33] argues, following section 354 Civil Code, for an analogous application of the property law provisions to all digital assets. *Diwok/Gritsch*[34] point out the problems arising from the understanding of crypto assets as incorporeal things when acquiring ownership. *Dafinger* argues that characteristics of property,

[28] Vonkilch and Knoll (n 9) 139 et seq.
[29] A Illedits, 's 354 ABGB' in Schwimann and Neumayr (n 12) para 1.
[30] Völkel (n 8) 385; Fleißner (n 9) 440 et seq; Vonkilch and Knoll (n 9) 139; Aigner (n 17) 816.
[31] Fleißner (n 9) 440 et seq.
[32] Vonkilch and Knoll (n 9) 139.
[33] Aigner (n 17) 816.
[34] G Diwok and D Gritsch, 'Bitcoin, Monetary Terms and Means of Payment' [2020] *Zeitschrift für Finanzmarktrecht* 68.

namely the power to exclude and the power to control, are present in crypto assets such as Bitcoin applying ownership rules in the narrower sense would be possible by means of analogy.[35]

Crypto assets on public blockchains are not based on a relative right. Thus, they belong to the category of other incorporeal things under section 292 Civil Code, such as radiation or sound waves. Due to their particular controllability, crypto assets have a pronounced quasi-physical character. Therefore, one should agree with *Fleißner* that despite their incorporeality, property rights in the narrower sense can be acquired in crypto assets. *Vonkilch/Knoll*[36] correctly point out that the property law provisions of the Civil Code are tailored to objects that can actually be controlled; however, as elaborated above, crypto assets are in no way inferior to tangible objects with regard to their controllability. The fact that most property law provisions are based on actual controllability[37] therefore serves as an argument for the applicability of the property law provisions also to crypto assets.[38]

It must be pointed out once again that not every crypto asset can be controlled in the same way. If the necessary minimum degree of control cannot be exercised over a particular crypto asset, the considerations made above do not apply. Smart contracts whose programming allows third parties to intervene in the position of control over tokens, ie, enables transfers without the consent of the authorised party, for example, or grants third parties the possibility of preventing transfers, are not suitable for conveying positions of ownership.

Whether sufficient dominion can be exercised over a particular crypto asset is a preliminary question for deciding whether this crypto asset is subject to the provisions of Austrian property law in a narrower sense. In the case of Bitcoin and comparable digital assets, this preliminary question can be answered in the affirmative.

D. Derivative Acquisition of Ownership

i. Physical Handover from 'Hand to Hand'

The basic case for the transfer of ownership in movable objects – which also includes crypto assets[39] – is the 'corporal transfer from hand to hand' (*körperliche Übergabe von Hand zu Hand*; section 426 Civil Code). Corporeal transfer is understood as the procurement of the actual custody in favour of the

[35] F Dafinger, 'Kryptowährungen und der Modus beim Eigentumserwerb in Österreich' [2022] *Recht Digital* 17.
[36] Vonkilch and Knoll (n 9) 139.
[37] Hofmann (n 18) para 1.
[38] *cf* G Kogler, 'Non Fungible Tokens und Sachenrecht' [2021] *Juristische Blätter* 685.
[39] Fleißner (n 9) 440.

transferee.[40] A thing is brought into a situation, by which it is actually under the control of the transferee.[41] The decisive factor is the possibility of exclusive influence, not necessarily a 'corporeal touching' of the thing and also not the change of location.[42]

'Hand to hand' is therefore not to be taken literally. What matters is the establishment of a close relationship which is sufficient to indicate that the acquirer is in possession of the thing.[43] Even if the law speaks of a 'corporeal transfer', this does not necessarily imply a restriction to corporeal objects. Also, incorporeal things can be 'corporeally' transferred from hand to hand if they can be controlled in a way comparable to corporeal things. In this respect, hand-to-hand transfer is possible in the case of crypto assets pursuant to section 426 Civil Code.

As was discussed above, crypto assets have a highly quasi-corporeal character. Despite their incorporeality, they can be controlled in (for incorporeal things) previously unknown intensity. Possession (control, dominion) is held by whoever knows the private key associated with the crypto assets. Therefore, the transfer on the blockchain leads to the transfer of possession from hand to hand according to section 426 Civil Code if it is made to an address whose associated private key is known to the acquirer.

ii. Transfer by Sign (Zeichen)

In the case of such movable objects, which by their nature do not permit a physical handover, the handover by means of a sign is permissible (section 427 Civil Code). If the transferor hands over the private key to the crypto asset to the transferee, for example, in the case of the transfer of a physical wallet, this would be an example of a transfer by sign. Disclosure of the private key is therefore a sufficient form of handover.[44] It is not necessary to ensure that neither the transferor himself nor a third party continues to have knowledge of the private key. Procuring sole possession is not mandatory for an effective handover by sign. If the transferee wants to ensure that they obtain sole possession, they must transfer the crypto assets to another address in their sole possession.

iii. Transfer by Declaration

Finally, a thing can be handed over by declaration (section 428 Civil Code). With respect to crypto assets, transfer by declaration is also permissible.[45] Transfer by

[40] B Eccher and O Riss, 's 426 ABGB' in Koziol, Bydlinski and Bollenberger (n 6) para 1 with further references.
[41] T Klicka and A Reidinger, 's 426 ABGB' in Schwimann and Kodek (n 5) para 1.
[42] Eccher and Riss (n 40) para 1 with further references.
[43] OGH 12. 3. 1996, 10 Ob 2035/96d.
[44] Fleißner (n 9) 441.
[45] Vonkilch and Knoll (n 9) 139.

constitutum possessorium, a shorthand transfer or handover *brevi manu* as well as instructions of possession (*Besitzanweisung*) are therefore also acceptable forms of handover in the case of crypto assets.

The prerequisite for this in the case of *constitutum possessorium* is that the person who has knowledge of the private key will in future hold the crypto assets to be transferred in the name of the transferee. In the case of shorthand transfer, the prerequisite for this is that the person who newly forms the corresponding will to possess certain crypto assets already had knowledge of the private key. Prerequisite for the instruction of possession is that the person instructed has knowledge of the private key.

E. Original Acquisition of Ownership

Ownership can be acquired originally (*originär*) in things that cannot be distinguished by individual characteristics (fungible objects) by blending, without good faith being required for the acquisition (section 371 Civil Code). Blending is present if the fungible things can no longer be distinguished from each other. Not only in the case of money and bearer instruments, but also in the case of other fungible things, acquisition of ownership by blending is possible.[46] If, for example, cash is still available in a distinguishable form, ie, if it has not been mixed with funds belonging to another person, ie, if it is separable and clearly distinguishable, it can be the subject of a property action and give rise to a right of segregation in insolvency proceedings.[47] However, if this cash can no longer be clearly allocated to a person and has been mixed with other assets of another person, this other person has acquired original ownership. Since crypto assets are fungible things, an original acquisition of ownership according to section 371 Civil Code is also possible. What is required is an indistinguishable commingling on an address on the blockchain.

V. Private Blockchains in Austrian Law

In addition to public blockchains such as Bitcoin or Ethereum, there are also private and centralised systems to consider. These private blockchains are characterised by the fact that only one person or a select group of people operate the infrastructure. These persons thus have control over the functioning and continuation of the system. Such a structure can be found in 'permissioned' blockchains, where these systems require the consent of one or more other persons to participate in the mining process or validation of blocks.

[46] T Klicka and A Reidinger, 's 371 ABGB' in Schwimann and Kodek (n 5) para 5.
[47] P Schulyok, 's 44 IO' in A Konecny (ed), *Insolvenzgesetze* (Vienna, MANZ, 2021) para 15.

The conclusions presented above for public blockchains are only applicable to private DLT networks in exceptional cases. Take, for example, the case of a blockchain whose entire infrastructure is operated by only a single person (natural or legal). In such a case, one person makes their technical infrastructure available to other persons. The relationship between operator of a private blockchain and the user is best described as the provision of software as a service by the operator.

From a purely technical point of view, also in this example a transaction request is still a validly signed and technically correctly structured instruction to transfer crypto assets or to interact with a smart contract. However, the legal classification of the transaction request is different from that of the public blockchain. In contrast to public blockchains, where the user does not care which person from an undefined group of miners or validators ultimately confirms the transaction request in a block, this is not the case in our example. In fact, there is only one person who can include the transaction request in a block, namely the operator of the respective blockchain. As a declaration of intent by the user, the transaction request is thus not a public offer of a reward, because these must be addressed to an undefined group of addressees. Instead, it is a regular contractual offer that can be accepted by fulfilment by the operator of the private blockchain. Acceptance results in the conclusion of a contract that might be governed by terms of service provided by the operator; or that instead might be governed by implied terms if no explicit terms of service exist. A transaction request in such a centralised private blockchain is therefore merely an offer by the user to the operator of the blockchain to record the transaction. In such systems, contracts are concluded between the users and the operator on an ongoing basis. If the user offers a transaction fee to the operator of the blockchain infrastructure in return for recording the transaction request in the blockchain, a contract for consideration is formed.

How does a permissioned DLT system fit into the picture, where, in contrast to the example discussed above, several different people each operate a node? Can such a system be qualified as 'decentralised' in the above discussed sense, resulting in the qualification of transaction requests as public offers of a reward? The answer depends on whether the parties operating the DLT infrastructure (as miners or validators, or in other roles) are contractually bound to one another in such a way that they form a (eg, civil law) company. If this is the case, it could be argued that the user interacts with only one entity, ie, the company formed by the miners or validators. In such a case, the user's transaction request remains a regular contractual offer. The situation may be different in case the operators of the permissioned DLT infrastructure do not form such a company but are rather bound to one another on the basis of non-corporate agreements. In such a case, as with other decentralised systems, the transaction request might still be regarded as a public offer of a reward. Unfortunately, no generally applicable answer can be given; rather, it depends on the specifics of a given permissioned DLT system.

Further, the considerations made when qualifying crypto assets on public blockchains do not apply when it comes to private blockchains. While the legal relationship between operator and user in its entirety (as personal property) is to be qualified as a thing (*Sache*) within the broad meaning of section 285 of the Austrian Civil Code,[48] it is doubtful that a crypto asset, as part of this legal relationship, can be viewed as constituting a separate and distinguishable thing. The considerations justifying this result in respect of crypto assets on public blockchains are simply not present. In particular, transactions on private blockchains in the sense here discussed are not immutable. While this question has not been settled in Austrian legal literature definitively, it seems reasonable to reject crypto assets on private blockchains as separate and distinguishable legally protected interests (*Rechtsgüter*).

VI. Crypto Assets in Insolvency

As discussed above, depending on: (a) the type of blockchain used (public or private), (b) the type of crypto asset (issuer or issuer-less), (c) the question of whether real-world assets are being tokenised (asset custodian present or not), and (d) the type of custody of the crypto asset itself (crypto custodian present or not) a number of different parties have to be considered for insolvency purposes. Based on the legal considerations also discussed above, the following first conclusions can be drawn. A detailed discussion of every single possible permutation of the identified matrix components must be reserved for other publications. The following should therefore only be understood as a first indication as well as an invitation to further legal discussion.

A. Insolvency Estate and Claims for Segregation

The insolvency estate encompasses all assets subject to execution which belong to the debtor at that time of, or which it acquires during, the insolvency proceedings (section 2(2) Austrian Insolvency Act). The total assets subject to execution include all assets belonging to the debtor at the time of commencement of the proceedings and which it otherwise acquires during the further course of the proceedings.[49]

The insolvency estate includes all movable and immovable assets of the debtor, such as shares in real property, including co-ownership shares, claims such as claims for damages, claims for rent, tenancy rights, virtual currencies, and

[48] Vonkilch and Knoll (n 9) 139; Fleißner (n 9) 56; Aigner (n 17) 819.

[49] G Feuchtinger and M Lesigang (eds), *Praxisleitfaden Insolvenzrecht*, 3rd edn (Vienna, Linde, 2010) 47.

the like.[50] Crypto assets are thus assets subject to execution either as virtual currencies or otherwise as movable property, unless exceptional circumstances apply. They are also part of the insolvency estate unless they are objectively unusable. In addition, they may be excluded from the insolvency estate if the crypto assets cannot be used for economic purposes and do not generate any income. Otherwise, they must be included in the inventory by the insolvency administrator, and the associated private keys and public addresses must be disclosed by the debtor. Crypto exchange platforms can be forced to provide information about debtor accounts with a protective order of the insolvency court.[51]

Pursuant to section 44 para 1 Austrian Insolvency Act, a right is granted to reclaim items that are part of the insolvency estate but which do not belong to the debtor in whole or in part. Anyone who can show that they have a right *in rem* or a personal right to an object is entitled to such segregation.[52] The person entitled to segregation is a third party who pursues a real property right or personal property right to which they are entitled independently of the insolvency proceedings. Whether such a third party is entitled is to be assessed exclusively in accordance with the general principles of property law.[53] The claim for segregation relates to things in the broader sense,[54] ie, it also covers crypto assets within the limitations discussed above. The most frequent reason for segregation is ownership[55] or co-ownership.[56]

B. Insolvency of the Operator

The possibility of an insolvency of the operator of a blockchain only needs to be considered in the case of a private blockchain. The insolvency of a miner or validator (as 'operator' in a broader sense in the case of a public blockchain) does not have an impact on the legal situation whatsoever. This is because, as pointed out above, holders and miners/validators are not in a contractual relationship with one another. Conversely, in cases where the legal relationship between holder and operator of a private blockchain constitutes the provision of software services, segregation claims (as discussed below) with respect to crypto assets are excluded.

In cases of crypto assets having an issuer, ie, in cases where a legal relationship between issuer and holder exists, an insolvency of the operator of a private

[50] ibid.
[51] M Lutschounig, 'Virtuelle Währungen in der Insolvenzmasse' [2022] *Österreichische Jurist:innenzeitung* 1179.
[52] Schulyok (n 47) para 2.
[53] ibid para 3.
[54] F Mohr, *Insolvenzordnung*, 11th edn (Vienna, MANZ, 2012) s 44 IO para 408.
[55] Schulyok (n 47) para 7.
[56] F Mohr (n 54) s 44 IO para 409.

blockchain has an impact on the legal situation only insofar as the means to represent the legal relationship (ie, the crypto asset) no longer exists. This does not invalidate the legal relationship between issuer and holder, however. In such a case, the holder and issuer will have to agree to substitute the crypto asset used to represent the legal claims by another crypto asset (or by other means).

In the case of crypto assets representing tokenised real-world-assets, with respect to the legal relationship between holder and issuer, the same conclusion can be drawn, based on the same legal arguments. Instead of the crypto asset used up until insolvency of the operator, a new form of representing instructions to the custodian must be agreed on.

Self-custody vis-à-vis third-party custody might have legal implications insofar as it may determine which person has to file a claim in insolvency proceedings. Whether the service provider or the holder is entitled to file the claim must be determined on the basis of their contractual relationship, ie, by answering the question: Who does the claim against the operator belong to?

C. Insolvency of the Issuer or the Asset Custodian

The possibility of an insolvency of the issuer of a crypto asset mostly needs to be considered in cases where a contractual relationship is formed between an issuer and a holder, and for the most part in cases where this contractual relationship comprises a continuing obligation (*Dauerschuldverhältnis*) as opposed to a specific obligation (*Zielschuldverhältnis*). An example of a continuing obligation is the promise of the issuer to redeem the crypto asset in the future or to make payments on it. In contrast, the mere sale of a crypto asset that can be used to interact with already existing smart contracts (and which do not need to be maintained by the issuer to operate properly) would constitute a specific obligation. Specific obligations can be relevant in an insolvency context in case one side has fulfilled their end of the contract but not the other. In the case of continuing obligations, this is the case by default.

When it comes to tokenised real-world-assets, an insolvency of the issuer may give rise to segregation claims vis-à-vis that issuer (in case the issuer also acts as custodian for said real-word-assets) or vis-à-vis a third-party asset custodian. Also, the insolvency of the asset custodian itself must be considered. Whether or not a segregation claim exists depends – in both cases – on the contractual relationship formed, in particular, whether or not the contract provides the crypto asset holder with ownership claims to the tokenised real-world assets.

D. Insolvency of the Service Provider (Crypto Custodian)

The possibility of an insolvency of a crypto asset service provider must be considered in cases where crypto assets are not held in self-custody by the holder, but

rather are held by a service provider (crypto custodian). Whether a right to segregation exists in the event of insolvency depends not only on the contractual agreement, but also on the correct safekeeping of the crypto assets.

With regard to the specific contractual agreement, two cases must be distinguished from one another. The customer's claim against the service provider can, for example, be directed toward receiving back a certain quantity of crypto assets, but the claim does not relate to specific individual pieces. The claim is then merely of debt nature, comparable to the claim of an account holder vis-à-vis a bank for the surrender of the credit balance. Just as the bank account holder has no claim to segregation against the insolvent bank, the customer also has no claim to segregation against the insolvent crypto asset service provider in such cases. Only in case the agreement between service provider and customer relates to the custody of specific crypto assets, a right to segregation can exist.

With regard to the correct safekeeping of the crypto assets, in order not to jeopardise the customer's claim to segregation in the event of the insolvency of the service provider, care must be taken to ensure that the customer (in case of a purchase from the service provider) acquires ownership in the crypto assets from the service provider and that the customer's ownership is not lost at a later point in time, eg, through commingling of assets. In the opposite case, when the customer deposits crypto assets with the service provider, care must be taken to ensure that the customer's original ownership is not lost in the course of the transfer to the service provider (or later), again, for example through commingling.

VII. Conclusion

When considering rights of crypto asset holders under Austrian law in the event of insolvency, care must be taken to identify which parties are involved, and exactly what claim is made against which other party. Further, any insolvency considerations must be based on a thorough understanding and clear categorisation of the different types of crypto assets in the private law framework. Only if both conditions are met, a clear picture of the legal ramifications can emerge.